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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/759,497 | 01/16/2004 | Tatsuo Fukushi | 59495US002 | 7691 |

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| EXAMINER | |
|---|---|
| HU, HENRY S | |

| ART UNIT | PAPER NUMBER |
|---|---|
| 1713 | |

DATE MAILED: 06/06/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/759,497 | FUKUSHI ET AL. | |
| | Examiner | Art Unit | |
| | Henry S. Hu | 1713 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *Amendment of April 6, 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-18* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-18* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *5-23-2005*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

## DETAILED ACTION

1. This Office Action is in response to faxed Amendment filed on April 6, 2005. An IDS filed on May 23, 2005 is also received. In view of the amendment, parent **Claims 1 and 15** (but not for parent **Claim 18**) were amended to specify using a peroxide curable component as well as "Retraction at lower temperature" is being added to "TR". The improper use of "including" and "further including" on **Claims 1, 3, 6, 15 and 18** were corrected as suggested by the Examiner. The Applicants allege that support of the claim amendment is on page 8 of Remarks. With respect to the specification objections (a) - (f), the Applicants have amended all the informalities as pointed out by the Examiner. The examiner thereby withdraws specification objections and claim objections in the previous Office Action dated January 6, 2005. **Claims 1-18 are now pending** with three independent claims (Claim 1, Claim 15 and Claim 18). An action follows.

### *Response to Argument*

2. Applicant's argument filed on April 6, 2005 has been fully considered but they are not persuasive. The focal arguments related to the patentability will be addressed as follows: In view of the Applicants' argument on pages **9-14** of Remarks, the 102(b) for Claims 1-10 and 14-18 and the 103(a) rejections for Claims 11-13 regarding Paglia reference are thereby combined to become a pure **103 rejection** due to the amendment as using a peroxide curable component for

parent Claims 1 and 15, while the other 103(a) rejections for Claims 1-18 over Brinati/Araki is sustained with rewriting for using "peroxide curing".

***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

4. *The limitation of parent* ***Claim 1*** *of the present invention relates to a compound comprising: (a)* ***an elastomeric copolymer*** *having interpolymerized monomeric units derived from* ***vinylidene fluoride monomer, at least one cure site moiety, and substantially no perfluorinated vinyl ether monomers****; (b)* ***a peroxide curable component****; and (c)* ***at least one mineral filler****, such that upon vulcanization the resulting compound has a* ***retraction at lower temperature*** *(****TR-10) of –20°C or less****. Parent* ***Claim 15*** *relates to Claim 1* ***without*** *the*

*limitation of using mineral filler, while other parent* ***Claim 18*** *relates to the process of making a compound of Claim 1 but only requires a curable component. See other limitations of dependent* ***Claims 2-14 and 16-17.***

5. Claims 1-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Paglia et al. (US 6,506,460) in view of Araki et al. (US 6,706,819 B1) for the reasons set forth in **paragraphs 6-7 and 12 of office action dated 1-6-2005 as well as the discussion below**.

6. Claims 1-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Brinati et al. (US 5,175,223 or its equivalent EP 445,839 A1) in view of Araki et al. (US 6,706,819 B1) for the reasons set forth in **paragraphs 9-11 of office action dated 1-6-2005 as well as the discussion below**.

7. **Applicants**: Applicants have claimed in parent **Claim 1** an unexpected way of obtaining a curable fluoroelastomeric composition comprising: (a) an elastomeric copolymer of **vinylidene fluoride, at least one cure site moiety, and substantially no perfluorinated vinyl ether monomers**; (b) a **peroxide curable component**; and (c) at least one mineral filler. Applicants allege that upon vulcanization the resulting compound has a **retraction at lower temperature** (TR-10) of **$-20^{\circ}C$ or less**. Parent Claim 15 relates to Claim 1 but using **two specified monomers in component (a)**; other parent **Claim 18** is a process of making the compound of Claim 1 but only a curable component is required.

8. With respect to **both 102 and 103 rejections for Paglia reference**, the Applicants allege that **Applicants' distinct curable composition is in the presence of a peroxide curable component for parent Claims 1 and 15**. The Applicants further allege that Paglia is only directed to UV curing system at room temperature (particularly see column 19, line 12-33; column 23, lines 15-17, 36 and 52); while hemolytic or heterolytic heat-induced decomposition of peroxide compound is not suggested.

With respect to the other **103 rejections for dependent Claims 1-18 over Brinati/Araki**, the Applicants allege that the involving references, alone or in combination, has only described using a phosphorus-containing accelerator with a specific formula on column 3 at lines 41-50 when the fluorinated blend is subjected to routine vulcanization with conventional fillers in order to make articles (column 3, line 36-59). No peroxide compound is suggested for curing.

9. **Examiner**: It is found by the Examiner that parent Claim 18 may be not **properly amended** by the Applicants in view of page 10 at lines 10-11 of Remarks. In view of the fact that two parent **Claims 1 and 15** have been amended to require the use of a peroxide curable component, the previous 102(b) and 103(a) rejections regarding Paglia are thereby combined to become a pure 103 rejection with the teaching of Araki on using peroxide curing system as following:

In a very close examination on Paglia's disclosure, the Examiner recognizes that only a UV curing system at room temperature has been applied and other system such as hemolytic or

heterolytic heat-induced decomposition of peroxide compound may cause some trouble. However, **Paglia is only restricted to use UV curing at a lower temperature when a rapid crosslinking reaction between the curable compound and the cure-site functional group in polymer is happened as being admitted by Paglia on column 19 at lines 14-16**. In view of the fact that various cure site monomers including bromine, iodine, chlorine are being used by Paglia as well as Araki has taught that a diiodine compound such as 1,3-diiodoperfluoropropane **and if necessary a "cure-site monomer" including "nitrile", bromine and iodine** can be incorporated in the copolymerization of fluorinated copolymers (column 7, line 5-26; column 5, line 59 – column 6, line 52; see working example on column 22, lines 35-64), such reactive cure sites in the copolymers can improve crosslinkability in order to obtain better mechanical properties **when the cure site is slowly cured with peroxide** (column 5, line 45-46; column 10, line 4-5) (column 10, line 43-60). It is noted that "cure-site" limitation on parent Claims 1, 15 and 18 does not exclude a slow or rapid crosslinking reaction.

10. In light of the fact that copolymers produced by all the involved references are containing the same or similar type of fluorinated monomers and cure site monomers, one having ordinary skill in the art would therefore have found it obvious to **modify Paglia's copolymerization process by adding or exchanging the cure-site monomer(s) suitable for peroxide crosslinking** as taught by Araki. By doing so, one would expect all embodiments in the same genus (cure site monomer) would succeed. Additionally, one would expect one additional advantage is that obtaining a final product with better mechanical properties when

cured with peroxide due to the presence of reactive sites in the copolymers. Furthermore, such a crosslniking reaction is slow and becomes controllable.

11. With respect to the other 103(a) rejection over Brinati/Araki, Brinati only uses a phosphorus-containing curing accelerator when the non-cure-site-containing fluorinated blend is subjected to routine vulcanization with conventional fillers in order to make articles. The primary reference Brinati is therefore silent about **adding "a cure site moiety" in the course of copolymerization so as to be curable by peroxide**. Araki has taught that a diiodine compound such as 1,3-diiodoperfluoropropane **and if necessary a "cure-site monomer" including "nitrile", bromine and iodine** can be incorporated in the copolymerization of fluorinated copolymers (column 7, line 5-26; column 5, line 59 – column 6, line 52; see working example on column 22, lines 35-64). By doing so, such reactive cure sites in the copolymers can improve crosslinkability in order to obtain better mechanical properties **when the cure site is slowly cured with peroxide** (column 5, line 45-46; column 10, line 4-5) (column 10, line 43-60). It is noted that "cure-site" limitation on parent Claims 1, 15 and 18 does not exclude a slow or rapid crosslinking reaction.

12. In light of the fact that articles produced by all the involved references are containing fluorinated copolymers having the same or similar fluorinated monomers, one having ordinary skill in the art would therefore have found it obvious to **modify Brinati's copolymerization process by adding the cure-site monomer(s) suitable for peroxide crosslinking** as taught by Araki. One would expect one advantage is that obtaining a final product with better mechanical

properties when cured with peroxide due to the presence of reactive sites in the copolymers. Additionally, the crosslniking reaction is slow and becomes controllable. Therefore, 103(a) rejection over Brinati/Araki is sustained with rewriting for "peroxide curing".

***Conclusion***

13. Applicant's amendment **necessitated the new ground(s) of rejection presented in this Office action**. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

14. Any inquiry concerning this communication or earlier communication from the examiner should be directed to Henry S. Hu whose telephone number is **(571) 272-1103**. The examiner can be reached on Monday through Friday from 9:00 AM –5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Wu, can be reached on (571) 272-1114. The fax number for the organization where this application or proceeding is assigned is (703) 872-9306 for all regular communications.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Henry S. Hu

Patent Examiner, art unit 1713, USPTO

June 1, 2005

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